



AMENDED SPECIFICATION
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COMMUNICATIONS-ENABLED IMAGE RECORDING DEVICE

CLAIM FOR PRIORITY

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TECHNICAL FIELD OF THE INVENTION

The invention relates to a communications-enabled image recording device for still and/or moving images, in particular a digital camera having a semiconductor image recording sensor, a CMOS/CCD chip or similar array, an image recording and 10 image data transfer control unit for the image data and/or text or audio data transfer to an external data sink.

BACKGROUND OF THE INVENTION

From the prior art, digital cameras having integrated fixed or exchangeable 15 memories, based on CCD sensors, have been known and commercially available since about the beginning of the 1990s. Such cameras or image recording devices have both an operating display and an indicating display which can be used to control the individual functions for image recording. Furthermore, the displays also make it possible to view the electronically stored recordings in order to check the 20 image quality on site.

Via existing standard interfaces, using a suitable software, it is possible for the 25 stored image data to be read out and for these contents to be accepted into the memory of a personal computer, in order to process the recording digitally or to output it via a connected printer or some other print medium.

Also known are so-called data communications terminals in compact telephone 30 form, with the aid of which e.g. e-mails can be received or sent. In conjunction with a notebook or a personal computer, such terminals in telephone form can be used as cableless modem. With rising transmission capacities of the mobile radio standards, it is possible also to transmit volumes of image data in real time in the course of the mobile communication.

The mobile phone with videophone adapter known under the product identifier 35 Datascope of Kyocera K.K., Japan, can be used as a visual display telephone. With an LC display present in the Datascope mobile phone as viewfinder, it is possible to produce color digital recordings. The image discernible in the viewfinder is stored as a JPEG file in the flash memory of the mobile phone. The

image file stored in the flash memory of the Datascope can then be sent as a binary file via a standard network using a special file transfer function, the so-called x-modem function. In the way, it is possible to receive data from the network using the videophone.

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The prior art described above has the disadvantage, however, that an additional display device, for example the display of a computer system, is necessary for the representation of user and/or status information for the actual transmission operation. Only through these further technical means it is possible for the user, in
10 the course of the communications and data transmission, to be able to assess the status of the individual operations or success or failure.

SUMMARY OF THE INVENTION

The invention relates to a communications-enabled image recording device for still and/or moving images, in particular a digital camera having a semiconductor image recording sensor, a CMOS/CCD chip or similar array, an image recording and image data transfer control unit for the image data and/or text or audio data transfer to an external data sink, such as e.g. a personal computer with image reproduction monitor or a mass storage device, and also having an operating display and having
15 operating elements for setting operating modes, and also a method for operating such a communications-enabled image recording device.

One embodiment of the invention disclose a communications-enabled image recording device for still and/or moving images, in particular a digital camera, and
25 a method for operating such an image recording device which make it possible, in a particularly simple manner, to represent the requiredstatus information and/or instructions in particular for the image data or some other data transfer, with the intention that this possibility shall be independent of the type of image recording device used or of the respective camera.
30 Furthermore, the intention is that when constructing communications systems with the utilization of special digital image recording devices, the overall costs shall be kept low, without having to dispense with an intrinsically desired functionality and functional diversity.

35 In another embodiment of the invention, there is a communications-enabled image recording device for still and/or moving images, in particular a digital camera.

In the invention, dispensing with an additional display unit or display by virtually allocating a dual function to the operating display that is present anyway in the image recording device. Thus, in a memory module, which may be part of the actual camera memory, images are stored which also include texts and/or symbols
5 which provide the user with information about the status of the image data communication or the communications system or which comprise instructions for operating the system.

This status information and/or instructions for the image data or some other data
10 transfer can be accepted via an interface present per se into the memory module or image memory, but can also be acquired photographically in a simple manner.

During operation of the image recording device in the function data transfer, the image data transfer control unit then has the
15 possibility of accessing the memory module in order to enable the desired representation of the status information and/or of the instructions on the display.

Accordingly, provision is made of a memory module for the representation of the above-described status information and/or instruction for the image data transfer
20 but also for the transfer of accompanying audio data on the operating display, the memory module being connected to an interface. Via this interface, externally offered digit and/or letter sequences and/or graphics or similar representations for the identification of the respective status or for the operating instruction can then be accepted into the memory module.

25 The abovementioned image data transfer control unit then has access to the memory module and makes it possible to display or enable the desired representation on the operating display.

30 In another embodiment of the invention, the memory module is a separately addressable area of the central camera memory. The operating display of the camera, for example a liquid crystal (LC) display, can be driven by a driver, in which case the driver fetches data from the memory module according to specification by the control unit.

35 The image data transfer control unit can be connected to a transmitting unit, in which case this transmitting unit may also be an integral part of the camera. The transmitting unit has a radio transmitting assembly with antenna for establishing a

wire-free connection via a GSM, UMTS, DECT or similar standard telecommunications network and/or a data transfer interface for wire-based, bit-oriented transmission via an ISDN or similar network.

5 The operating display of the camera or the display driver can be driven externally, which means that it is possible, independently of the respective camera type, by means of the remote controllability, to call up status information and/or instructions for the data transfer which are to be correspondingly represented on the display.

10 In the same way as the transmitting unit, the image data transfer control unit may also be an integral part of the camera.

In still another embodiment of the invention, in order to operate the image recording device for displaying status information and/or instructions on the operating display for or during the data transfer, in particular image data transfer, a digit and/or letter sequence and/or graphic or a pictorial representation is read from the camera memory, the selection of the representations being automatically initiated by the image data transfer control unit in accordance with the respective commands and/or operations.

The digit and/or letter sequences, graphics or other pictorial representations which are stored in the memory can be erased by means of the above-described external access, but can also be changed and thus updated.

25 In one aspect of the invention, it is possible that when the image recording device, in particular a camera, is connected to a memory for addressing data sinks or has such a memory, the status information also comprises, for example, a photograph or a graphical representation which specifies the user or the data sink. It is thus conceivable for a telephone number memory to contain the photograph of the subscriber as an alternative or in addition to the names or abbreviated names, said photograph being presented in a selection memory on the camera display, thereby simplifying the handling of the data communication between data source and data sink.

35 BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be explained in more detail below using an exemplary embodiment and also with the aid of figures.

In this case:

- Figure 1 shows a basic illustration of an image data communications system.
- 5 Figure 2 shows a block diagram of the image recording device with the possibility of displaying status information and/or instructions for the data transfer with recourse to corresponding graphical .

DETAILED DESCRIPTION OF THE INVENTION

- 10 The image data communications system shown in figure 1 is based on an image data source and at least one image data sink. The image data source comprises the image recording device 1, a control unit 2 and a transmitting unit 3. The data sink comprises receiving unit 4 and also image reproduction unit 5.
- 15 The image data transmission can be effected, with the utilization of the transmitting unit 3 and receiving unit 4, either in a wire-free manner, e.g. via the GSM mobile radio network, or else in a wire-based manner, e.g. via the telephone network according to the ISDN standard.
- 20 Control and monitoring of the image transmission and reception process from the data source to the data sink usually necessitate components for optical reproduction of the status information and of operating instructions both at the transmitter end and at the receiver end. For the representation of transmitted image data andfor the indication of corresponding status information, previous systems use the monitor of
25 a computer system operating as control unit 2.
According to the exemplary embodiment, the display present in image recording devices, in particular digital still image cameras, is not only utilized for image reproduction but is also used for outputting instructions for operating the camera and for the representation of status information. By virtue of the fact that it is
- 30 possible to have recourse to the display present in the image recording device, it is possible to dispense with an additional display unit or a monitor in connection with the control unit 2.
- According to figure 2, which shows a block diagram of a digital camera, the latter has an e.g. LC or TFT display 6. The display, which usually serves for reproducing recordings and includes the possibility of representation of a menu, interacts with a display driver 7.

A memory module 8 is able to accept, via an interface 9, externally offered digit and/or letter sequences and/or graphics or similar representations which enable identification of the respective status or represent an operating instruction.

- 5 The image data transfer control unit 10 firstly has access to the interface 9 and is able to activate and enable corresponding address ranges in the memory module 8. Through simultaneous activation of the display driver 7, the specific representations held in the memory module 8 are represented on the display 6, with the result that e.g. the information "image data receiver is selected" or "image data
10 successfully transmitted, you may switch the device off" becomes visible.

- For reading in such representation data records, it is possible, as can be seen from the block diagram according to figure 2, for the image data transfercontrol unit 10 to enable the data acceptance via the interface 9 toward the
15 memory module 8 and to ensure that this information is written to correspondingly provided memory areas. In a preferred exemplary embodiment, the memory module 8 is a reserved addressing area of the actual camera memory, with the result that additional hardware requirements can be reduced to a minimum.

20 It becomes clear from the exemplary embodiment that, with the solution described above, it is not only possible to dispense with additional display units for a control unit 2, rather it is possible to integrate such a control unit including transmitting unit 3 into the camera, thereby increasing the functionality of the latter. The outputting and the content of status messages on the camera display are, moreover,
25 totally independent of the camera used, provided that the possibility is afforded there of correspondingly remotely controlling the camera display, i.e. accessing the display driver 7.